



US009636008B1

(12) **United States Patent**  
**Elazar et al.**

(10) **Patent No.:** **US 9,636,008 B1**  
(45) **Date of Patent:** **May 2, 2017**

(54) **USING AN INTRAORAL MIRROR AS A  
CAMERA VIEWFINDER, AND  
APPLICATIONS THEREOF**

(71) Applicant: **Dental SmartMirror, Inc.**, Chicago, IL  
(US)

(72) Inventors: **Gidon Oded Elazar**, Cohav Yair (IL);  
**Dan Zidkiah Harkabi**, Moshav  
Lachish (IL); **Joshua Israel**  
**Wachspress**, Modi'in (IL)

(73) Assignee: **DENTAL SMARTMIRROR, INC.**,  
Chicago, IL (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/360,342**

(22) Filed: **Nov. 23, 2016**

**Related U.S. Application Data**

(60) Provisional application No. 62/354,694, filed on Jun.  
25, 2016, provisional application No. 62/354,273,  
filed on Jun. 24, 2016, provisional application No.  
62/343,034, filed on May 30, 2016, provisional  
application No. 62/341,629, filed on May 26, 2016.

(51) **Int. Cl.**  
**A61B 1/247** (2006.01)  
**H04N 5/225** (2006.01)

**H04N 5/232** (2006.01)  
**G06K 9/00** (2006.01)  
**A61B 1/05** (2006.01)  
**A61B 1/06** (2006.01)  
**A61B 1/00** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **A61B 1/247** (2013.01); **A61B 1/00009**  
(2013.01); **A61B 1/00195** (2013.01); **A61B**  
**1/05** (2013.01); **A61B 1/06** (2013.01); **G06K**  
**9/00255** (2013.01); **H04N 5/2256** (2013.01);  
**H04N 5/2257** (2013.01); **H04N 5/23238**  
(2013.01)

(58) **Field of Classification Search**  
CPC ..... **A61B 1/247**  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

7,713,058 B2 5/2010 Takahashi

*Primary Examiner* — W B Perkey

(74) *Attorney, Agent, or Firm* — Sterne, Kessler,  
Goldstein & Fox P.L.L.C.

(57) **ABSTRACT**

Disclosed embodiments integrate a camera into an intraoral  
mirror. Integrating a camera into an intraoral mirror provides  
an efficient way to record and display what is visible to the  
healthcare provider in the mirror.

**20 Claims, 32 Drawing Sheets**

